1995

A Picture Is Worth a Thousand Words: Using Photo CD To Produce Extension Publications

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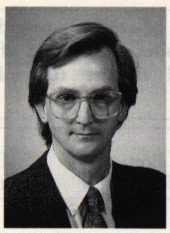
Abstract
IOWA STATE UNIVERSITY HAS PUBLISHED A "crops and pests" newsletter for the agricultural community since 1961. The newsletter was published weekly during the growing season. Articles were contributed mostly by state extension entomologists, weed scientists, and plant pathologists. Occasionally, articles were written by agronomists and soil-fertility specialists. The newsletter was originally mimeographed and, more recently, photocopied onto plain paper. Sometimes it included line 'illustrations. As with many newsletters, it was a valuable source for current crop information and historical data.

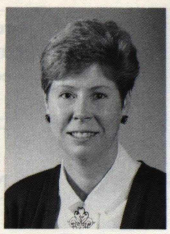
Disciplines
Entomology

Comments
This article is published as Rice, Marlin E., and Wendy Wintersteen. "A picture is worth a thousand words: using photo CD to produce extension publications." *American Entomologist* 41, no. 2 (1995): 72-74. doi:10.1093/ae/41.2.72. Posted with permission.

A Picture Is Worth a Thousand Words: Using Photo CD To Produce Extension Publications



Rice



Wintersteen

MARLIN E. RICE AND WENDY WINTERSTEEN

IOWA STATE UNIVERSITY HAS PUBLISHED A "crops and pests" newsletter for the agricultural community since 1961. The newsletter was published weekly during the growing season. Articles were contributed mostly by state extension entomologists, weed scientists, and plant pathologists. Occasionally, articles were written by agronomists and soil-fertility specialists. The newsletter was originally mimeographed and, more recently, photocopied onto plain paper. Sometimes it included line illustrations. As with many newsletters, it was a valuable source for current crop information and historical data.

In 1992, we envisioned an innovative newsletter that would expand the format to include four-color photographs of pest and beneficial species, plus crop diagnostic symptoms. *Four-color* is a printer's term that describes the basic colors (cyan, magenta, yellow, and black) used in color printing. The goal was to improve the newsletter's visual utility and content quality without compromising turnaround time in printing and mailing. As entomologists, we were frustrated with trying to describe an insect or its injury in the text of an article to non-entomologists who might be unfamiliar with the particular insect in question. The maxim that a picture is worth a thousand words seemed to describe best what we were searching for. In December 1992, we published our first four-color newsletter. It was renamed *Integrated Crop Management* to reflect not only integrated pest management, but also the broader aspects of crop production.

In 1993, 27 issues were published (weekly during the growing season, biweekly or monthly during the off season) containing a total of 221 articles and 165 four-color photographs. Initially, most color illustrations were produced by obtaining color separations, which was expensive. By the middle of the summer, we began to pursue the use of a CD-ROM, which permitted us to digitize color slides onto a disk. Articles were written by 21 extension specialists from the departments of entomology, agronomy, plant pathology, and agricultural engineering, which was about twice the

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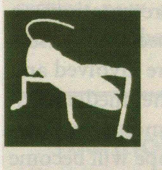
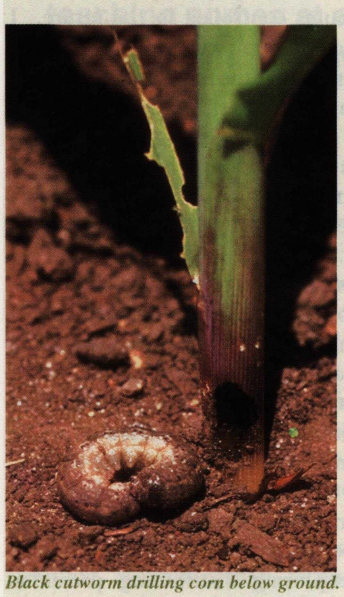


Insects and Mites

Black cutworm problems begin

by Marlin E. Rice, extension entomologist, Department of Entomology



Black cutworm drilling corn below ground.

Black cutworms will be the most serious corn pest during the next week or two. By May 23, significant amounts of leaf feeding had been reported from locations scattered across the state and as far north as Kossuth County. John Holmes, extension field specialist in crops, reported finding 20 percent leaf feeding near Steamboat Rock in Hardin County. Jerry Neppel, extension associate in Union County, found up to 16 percent of the plants in his area wilting from underground cutting. Jay Johnson, Prairie Crop Pro Tech in Waterloo, reports that more than a thousand acres that he has been scouting in east central Iowa has economic infestations. Tom Hillyer, Nichols AgriService in Muscatine County found a field with 25 percent cut plants. (See the Field Notes section on page 91 for additional reports.)

The dry soil conditions across most of Iowa will allow the cutworms to feed below the soil surface. They will cut the small plants, which will wilt, but sometimes not fall over immediately. On large plants, the cutworms may drill into the side of the plant and kill the growing point without completely cutting the plant. This belowground feeding and damage can frustrate black cutworm control efforts. It is nearly impossible to get a liquid rescue treatment on the insects because of their subterranean habits. Control is usually achieved when the insects leave one plant and crawl across the soil surface in search of other corn plants. Each of the recommended insecticides listed on page 86 should provide 7 to 10 days of residual control for cutworms.

If cutworm problems have not been detected yet in a corn field, continue scouting until the plants have five, fully-

In this issue:

IOWA STATE UNIVERSITY
University Extension
Ames, Iowa

Front page of the *Integrated Crop Management* newsletter often has color images showing relevant pests or crop damage. The photograph of the insect was transferred from a Photo CD to the newsletter.

number of contributing authors who participated in developing the previous photocopied newsletter.

An extensive marketing effort was undertaken to increase the number of subscribers and decrease the newsletter production costs. The new format was promoted with a complimentary copy and an invitation to subscribe, followed by a reminder. Complimentary copies of the first issue of the newsletter were distributed to previous subscribers, members of five agricultural associations, Soil Conservation Service directors, Vo-Ag instructors, and the Bankers Association. In addition, news releases were developed and published in a variety of agribusiness association newsletters and farm magazines. As a result, subscriptions approached 2,500, a 48% increase from 1990. This increase occurred even though the subscription rate doubled from $15 to $30.

Because studies have shown that newsletter evaluations can provide valuable information, a reader survey was mailed to all subscribers at the end of the growing season and was returned by 23% (n = 557). They were asked to rate the newsletter quality as poor, fair, good, very good, or excellent. The following items were rated a composite good, very good, or excellent: timeliness of information (97%), readability of text (99%), usefulness of management recommendations (99%), and illustrative value of color photos (99%). The highest single category rating was given for the illustrative value of the color photographs; they were rated excellent by 69% of the readers. Even though the annual subscription cost was doubled, our readers rated the benefit as greater than the cost (68%) or equal to the cost (30%). Eighty-six percent of the readers said *Integrated Crop Management* contained information not available elsewhere.

A primary objective of our newsletter was to educate our readers about relevant, up-to-date, research-based crop production and protection practices. Seventy-four percent said they had changed a pest-management or crop-production practice as a result of information in the newsletter. Changes were made in the following areas: scouting practices (62%), crop production (51%), pesticide selection (44%), pesticide timing (40%), fertilizer rates (31%), and nonchemical controls (10%). For readers who subscribed to the previous newsletter, *Integrated Crop Management* was rated as better (95%) or about the same (4%).

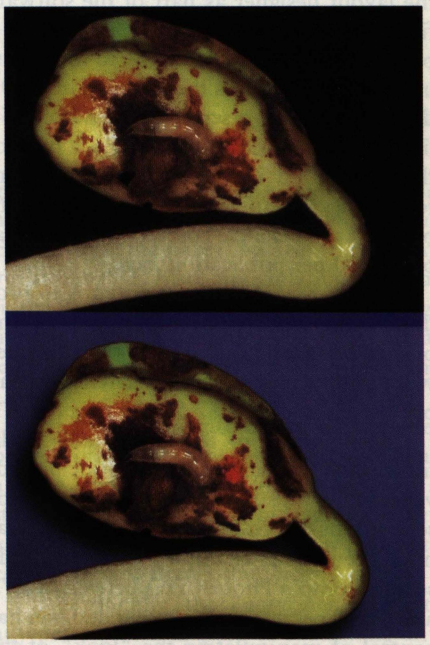
The most substantial and innovative change made in our newsletter was the use of Photo CD technology to produce four-color images, instead of the use of the traditional color-separation process. Photo CD allowed us to print numerous, high-quality, color photographs at a considerably lower cost. This change reduced printing costs from approximately $100 for a single four-color separation to $28 per newsletter page, regardless of the number of Photo CD images on the page. The remainder of this article presents the mechanics of how the *Integrated Crop Management* newsletter is constructed.

Photo CD. Photo CD technology was developed by Kodak to let photo finishers store processed film in digital form on low-cost CD-ROMs (compact disk-read only memory). Color slides are scanned onto the CD in a highly compressed form in five resolutions, ranging from several kilobytes to several megabytes. Each CD holds up to 600 megabytes of digital information in a form that is relatively secure from the effects of aging and handling and is not affected by magnetic influences. Up to 100 color slides in five resolutions can be put on one compact disk. All 100 slides can be scanned onto the disk during one session, or images may be added to a disk at a later date. The cost is $2.40 per slide up to 60 slides, or $1.75 for more than 60 slides. Sending the slides by next-day delivery, having the CD scanned and returned, takes only three days.

The principal advantages of the Photo CD over the color separations are cost savings and image manipulation . . . .the Photo CD allows us to have a large reference of photographs ready for future newsletters.

Photo CD to Hard Drive. The Photo CD is placed in a CD drive and read by the computer software. A slide is selected from the CD by using Kodak's Acquire software that allows the digitized image to be read by another software package, Adobe PhotoShop. This software imports the image into PhotoShop where it can be saved to the hard drive.

Image Manipulation and Placement. After the image is saved to the hard drive, it can be manipulated. This includes sharpening and adjusting of highlights and shadows, color saturation, overall darkness or lightness, and contrast. The image also can be reversed (creating a mirror image) and minor imperfections can be "erased." All of these manipulations can add a fresh look to a photograph. Changes to the image are saved, reopened in Aldus PrePrint for final adjustments, and saved as a CMYK (cyan-magenta-yellow-black) file. The publication is created in PageMaker 5.0 with the image imported, cropped to fit, and placed.



Images on a Photo CD can be cleaned up before publication. The original photograph of the seedcorn maggot on a soybean cotyledon had a black background. This image was transferred from the Photo CD and manipulated with a software program for a more pleasant visual effect. The top photograph of the two corn rootworm beetles is the original. The bottom photograph has been computer manipulated to remove the corn silk from behind the western corn rootworm, plus the antenna and corn silk in the bottom left corner.

Publication Image Setting. Traditionally, the layout designer placed blank windows in a publication just before plate burning at the printer. With the Photo CD, the image is embedded in the publication by the layout designer as part of the software file. The publication is saved as a file to a portable hard drive and delivered to a printing service. The file is then printed at 2,400 dots per inch and a screen frequency of 150 lines per inch to negative film. Each page of the publication is created in negative film four times (cyan, magenta, yellow, and black). Each negative costs $7.00 for a total of $28.00 per publication page.

Color Key. An optional step is to produce a color key that previews how the printed publication should look. The printer will use the color key as a reference during printing. The cost is $7.50 per page.

Comparison of Photo CD and Traditional Color Separation. The principal advantages of the Photo CD over the color separations are cost savings and image manipulation. For example, cost per slide scanned onto a Photo CD is between $1.75 and $2.40 per image; the layout designer has control of manipulating the "look" of the image; the CD image can be used repeatedly over an indefinite period of time; and the Photo CD allows us to have a large reference of photographs ready for future newsletters. Conversely, the traditional color separation cost is about $70.00 per slide; the color separation must fit into a "window" reserved in the final page design; stripping the color separation into the "window" costs an additional $30.00 in labor at the printer's; and the color separated image can be used again, but only in the same size that it was originally produced. The layout designer has no control over the image when it is sent to the color separator.

Images produced with either the Photo CD or color separation have front-end costs that must include layout-designer time for cropping, sizing, and processing, which is estimated at 30 minutes per CD image and 15 minutes per color separation.

Additional Advantages of Photo CD. In addition to the advantages noted for the newsletter production, there are four others: (1) color slides (or black and whites) are permanently archived and easily accessed; (2) Photo CD images can be manipulated on the computer, written or drawn on, superimposed on each other, image reversed, color changed, etc., and produced as educational slides; (3) changes in publication for reprinting can be accomplished easily because the entire publication can be archived on a disk; and (4) educational slides and poster files can be archived for future updating and changes.

Publication Cost Comparison. Photo CD publications also result in considerable cost savings. For example, a four-color, eight-page publication with 16 color photographs costs 70% less than a traditional publication containing the same information. This cost includes layout design, image setting, and Photo CD scans.

Newsletter Publication. It may seem that this entire process of producing a four-color newsletter is an arduous and time-consuming task. Fortunately, it is not, or the process would be self defeating. The editing, layout and design, re-editing, negative production, printing, and mailing of our newsletter requires four days from start to finish. A primary reason for the success of the newsletter is that numerous Iowa State University Extension employees in communications, publications distribution, printing, and purchasing departments are committed to helping us provide quality educational materials. The result is an innovative newsletter that meets the needs and exceeds the expectations of our extension clientele. The value of a color photograph is that it can show at a glance what would take a thousand words to describe.

Acknowledgments

Many thanks to our layout designer, Dennis Melchert (Ames Best Communications), for helping us to utilize the Photo CD technology in developing a newsletter for Iowa's crop producers. This is journal paper no. J-16013 of the Iowa Agriculture Experiment Station, Ames, Iowa, project no. 3207.

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